



# Cool Roofs – An Overview

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Presentation for:  
Quarterly Facilities and Infrastructure Meeting

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# White Roof vs. Cool Roof

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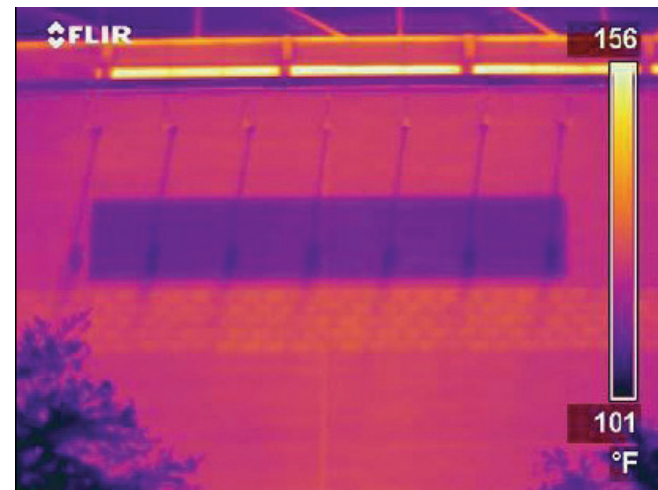
- The terms “white roof” and “cool roof” are often mistakenly used interchangeably.
  - ✓ A white roof is not necessarily a cool roof and a cool roof is not necessarily white.
- “Cool Roofs” come in many style as defined by industry standard and can include:
  - ✓ Metal
  - ✓ Single ply
  - ✓ Modified bitumen
  - ✓ Acrylic coated



# Light Color is a Good Start



Solar reflectance alone can significantly influence surface temperature, with the white stripe on the brick wall about 5 to 10°F (3-5°C) cooler than the surrounding, darker areas.

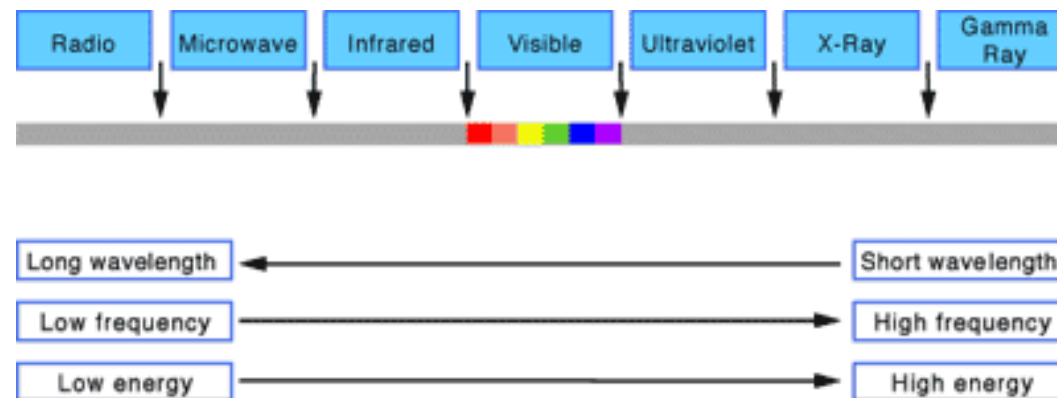




# Definition of a Cool Roof

A “Cool Roof” is defined as a roof covering which efficiently reflects the sun’s heat and emits absorbed solar radiation back into the atmosphere.

By doing so, the roof covering remains relatively cooler and less likely to transfer heat down through the other components of the roof system and then into the building, thereby reducing the cooling load upon the facility HVAC system.



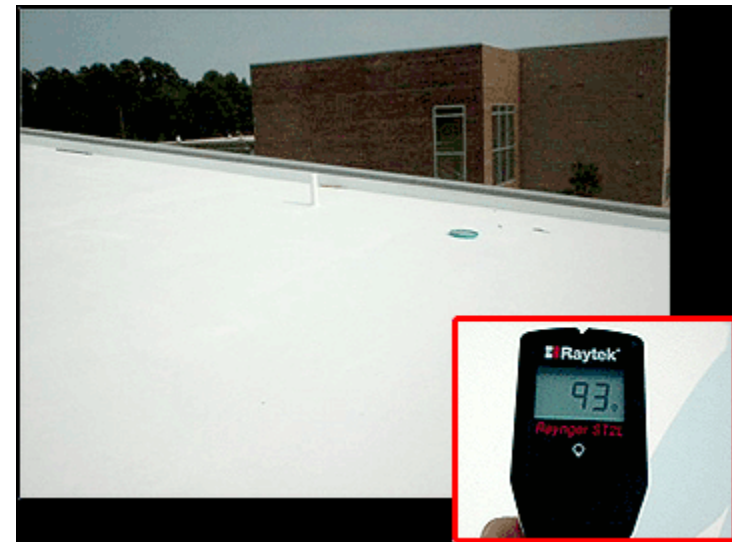


# Cool Roof Impact



Roof before treatment, thermometer reads 178-degree Fahrenheit at the roof surface on a hot summer afternoon.

These pictures, courtesy of Hydro-stop, Inc. show hand-held temperature readings from before and after a cool roof treatment.

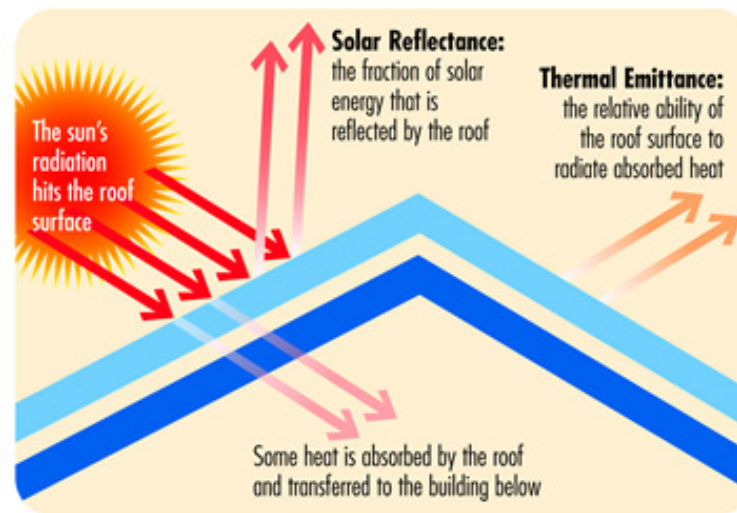


After a cool roof was installed, there was a dramatic decrease in roof air temperature. Pictures courtesy Hydro-Stop, Inc.



# Elements of “Cool”

The two factors which determine the degree of efficiency of a “Cool Roof” are the solar reflectance (SR) and thermal emittance (TE), both measured on a scale of zero (0) to one (1), with the least efficient essentially functioning as a “black box” which absorbs all the heat and radiation while the most efficient reflects all heat and radiation; the greater the decimal number of SR and TE, the better the efficiency.



As reported by the Cool Roof Rating Council



# Standards

- **Currently Two Recognized Standards:**
  - EPA Energy Star Roof Product Program
    - Low-sloped roofs (less than 2:12) / Flat roofs average initial reflectivity of at least 0.65
    - Steep sloped roofs initial reflectivity of 0.25 or more.
  - LEED Version 2.2 (approved Oct. 31, 2005)
    - Solar Reflectance Index (SRI) combines Solar Reflectance (SR) and Thermal Emissivity (TE) as a measure of materials overall ability to reject solar heat.
    - Low slope roofs (less than 2:12) a SRI of 78
    - Steep-sloped roofs (greater than 2:12) must have an SRI of 29.
- **NNSA RAMP adopted the LEED Standard**



***New Roof and HVAC- Sandia***